

| SESSION AT-A-GLANCE    | WHO?                  | HOW LONG?  |
|------------------------|-----------------------|------------|
| Introduction           | Facilitator           | 10 minutes |
| The Game               | Facilitator, audience | 25 minutes |
| Debrief and Discussion | Facilitator, audience | 15 minutes |

## Peg Game

### Why Use This Game

- To teach how to develop and test a hypothesis.
- To teach that multiple cycles of hypothesis development and testing are good ways to develop solutions.
- To show how to develop better knowledge as you go through these multiple cycles.

### Target Audience

Team members and others who will be developing and running PDSA cycles. Some teachers find this game works best with senior staff, others have found it successful for all participants.

### Type of Game

A competition among teams.

### Key Concepts

- Developing theories is essential to learning and improvement.
- “Tests of change” need to be planned and carefully evaluated.
- Data collection and documentation are important.

### Source, History and Resources for More Information

This game has a long history. Its application to learning and improvement was identified by Lloyd Provost who uses it to teach the concept of PDSA at the Institute for Healthcare Improvement’s Breakthrough Series College.

### Materials

For this game, you will need:

- Copies of the game board for each participant (see Attachment 1)
- Fourteen markers for each participant. You can use coins for the markers, or any small round candy. M&M’s™ work well
- Copies of the “Score Sheet: Theories and Results” (Attachment 2) for each participant
- Flip chart and felt-tipped marking pens
- Overhead or LCD projector
- Background slides or overheads: “PDSA for the Peg Game,” and “To Be Considered a PDSA Cycle” (Attachments 4 and 5)

## Preparation

To prepare for this session:

- Familiarize yourself with the session's structure and content:
  - Read through the game instructions and key teaching points in their entirety.
  - Practice the game itself (see Attachment 6 for the answer key.)
  - Practice presenting the key teaching points.
- Prepare the room:
  - Arrange chairs around a table or tables. A U-shaped table works well.
  - Set up a small desk, table or podium in the front of the room.
  - Set up the equipment (e.g., flip chart and overhead projector or LCD projector) you will use to introduce the game and record the results. Test the equipment to make sure it works.
  - Prepare the flip chart or an overhead transparency with the "Team Results Summary" (Attachment 3.)

## Playing the Peg Game

### *Welcome and Introductions*

To begin the game, welcome participants and thank them for their participation. If necessary, ask individuals to introduce themselves to the group.

### *Learning Objectives*

Tell participants that by the end of the session they will:

- Know how to develop theories of change and how to design tests of these theories.
- Understand how to use the results of these tests to design new tests that reflect what they have learned.
- Appreciate the roles that ongoing data collection and documentation play in carrying out PDSA cycles.
- Begin to see how to apply these concepts to their HIV program.

### *Agenda*

Provide a brief description of the session's primary components:

1. Background to the Peg Game.
2. The Game Itself.
3. Debrief and discussion on what the game shows, and how its lessons can be applied to HIV care.
4. Feedback and Close.

## Background to the Game

### *Facilitator's note*

As teams work to make improvements in their HIV programs, they should be thinking “we think this change will make things better because it will...” If they do this, teams then will have a way to assess whether the change was successful. Thinking about why a change might work involves developing a theory, and teams often find it hard to be disciplined enough to develop and test these theories. The Peg Game encourages teams to be systematic about designing and trying out solutions; the teams that do this well find the solution more quickly.

The challenge in running this game is to make sure your teams develop a hypothesis before each cycle. Participants may get excited about trying to find the solution and miss the real point of the game unless you keep reminding them and help them to see it.

### *Key points to explain to your audience:*

- Describe the components of a PDSA cycle. Use (and project) Attachment 5 to help you. Stress the importance of thoughtful planning before each test and careful assessment of the result. Random doesn't work.
- Review what is meant by “plan,” “do,” “study,” and “act.” Use (and project) Attachment 4 to help you. Reinforce that the purpose of the game is to teach how to run a PDSA cycle.
- Add that multiple PDSA cycles result in better understanding and better results. Indicate that the game will illustrate this point as well.

## The Game Itself

(This description is adapted from the manual for the Institute for Healthcare Improvement's Breakthrough Series College.)

1. Give each person a game board (Attachment 1) and markers. Each person completes the game.
  - a. Each participant covers each number on the game board with a marker, leaving one number blank. The participant can then remove markers from the game board by “jumping” one marker over another and then into the blank spot: the marker that is jumped over then can be removed (people who have played checkers will understand this immediately). The goal is to set up your movements so that you end with only one marker remaining on the board. Each participant continues for as long as he or she can, and notes how many markers remain on the board.
2. Tally everybody's results. Identify the best performers and have them become leaders of teams of 3-4 people (depending on the size of your group).
3. The leader teaches his or her team the “best” approach and then team repeats as a group.
4. Tally results. Reconvene as the large group and discuss what we have learned. In most cases, this “shared learning” will not result in better performance. Discuss why. Ask: how many cycles have we run? (The answer is none. Up to this point, the team hasn't carried out any of the parts of a PDSA cycle.) Also, no record has been kept of the way the result was achieved. Ask teams then to try several PDSA cycles and see how these go.
5. Each team then completes a full PDSA cycle. Distribute Attachment 2 and make sure each team records its theories, plans and results.
  - a) The Plan should include the theory and prediction, the approach and a plan for recording what was done (you may provide a hint to the groups that they should record each move in order, recording the space moved from and to, e.g., 6-1, 4-3).

- I) Some theories: keep pegs bunched up, keep pegs away from corners, leave one side empty, keep middle empty until the end.
- II) Some plans: work backwards, work independently.
- b) Do involves completing the game one time, following the plan. Each team should record its results and any problems or other observations.
- c) In the Study phase each team should review what happened, adjust theories, adjust plans for the next cycle.
- d) Act means to carry out the next cycle.
- 6. Each team completes a second cycle (you can suggest that a good strategy might be for each member of the team to run an independent test of the “same theory” and then see who gets a good result).
- 7. Complete additional cycles as time permits.
- 8. Record each team’s best result on the flip chart or overhead: “Summary of Peg Game” (Attachment 3)

## Debrief and Discussion

Reconvene as a large group. Review results.

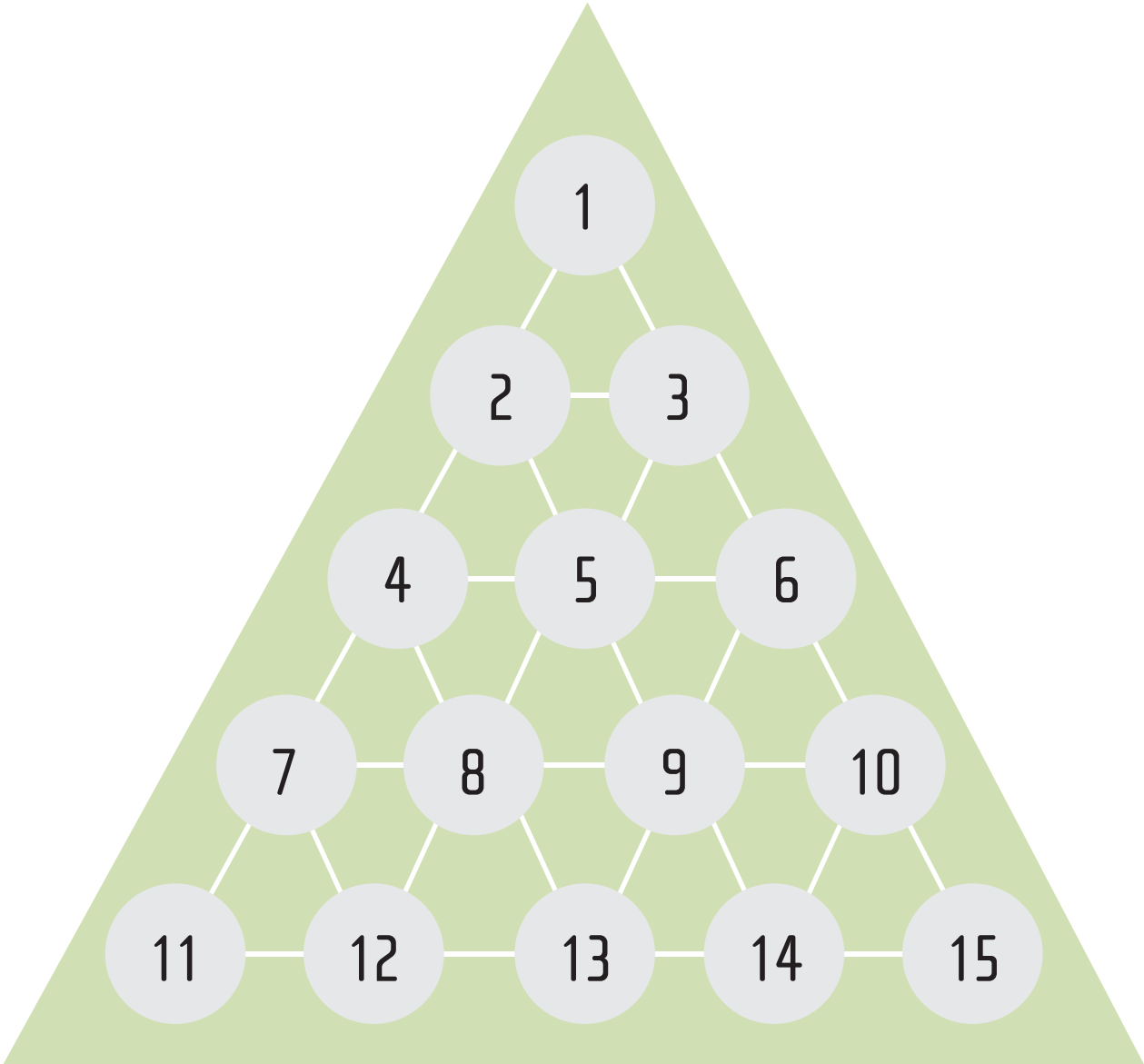
- Ask the team with the best results to describe their theory and plan to the others.
- If necessary, walk through the answer key (Attachment 6).
- Ask participants how the PDSA approach differed from their initial approach to the problem. Discuss how whether using PDSA was an improvement.
- Ask participants about improvements they have tried to make in their HIV programs:
  - Did they use a PDSA approach? Did they begin by testing their change on a small scale – with one provider’s patients, for example – and for a short (one or two sessions) period of time?
  - If so, did it work? How might they have done PDSA even better?
  - If not, do they think using PDSA cycles would have made this effort more successful? Why or why not?
- Ask participants where might they use PDSA in their current work.

## Feedback and Close

- Ask your audience for feedback on whether this session met its objectives. Take notes of their response on a flip chart, and keep it for your use in the future.
- Schedule an informal follow-up session with any audience member who wants clarification or more information on the game or the concepts you discussed.
- Thank your audience and congratulate them on their hard work and success.

Attachment 1

Peg Game: The Game Board



Peg Game

## Attachment 2

## Score Sheet: Theories and Results

| CYCLE | THEORY TESTED | PLAN | RESULT |
|-------|---------------|------|--------|
| 1     |               |      |        |
| 2     |               |      |        |
| 3     |               |      |        |
| 4     |               |      |        |
| 5     |               |      |        |
| 6     |               |      |        |

Attachment 3

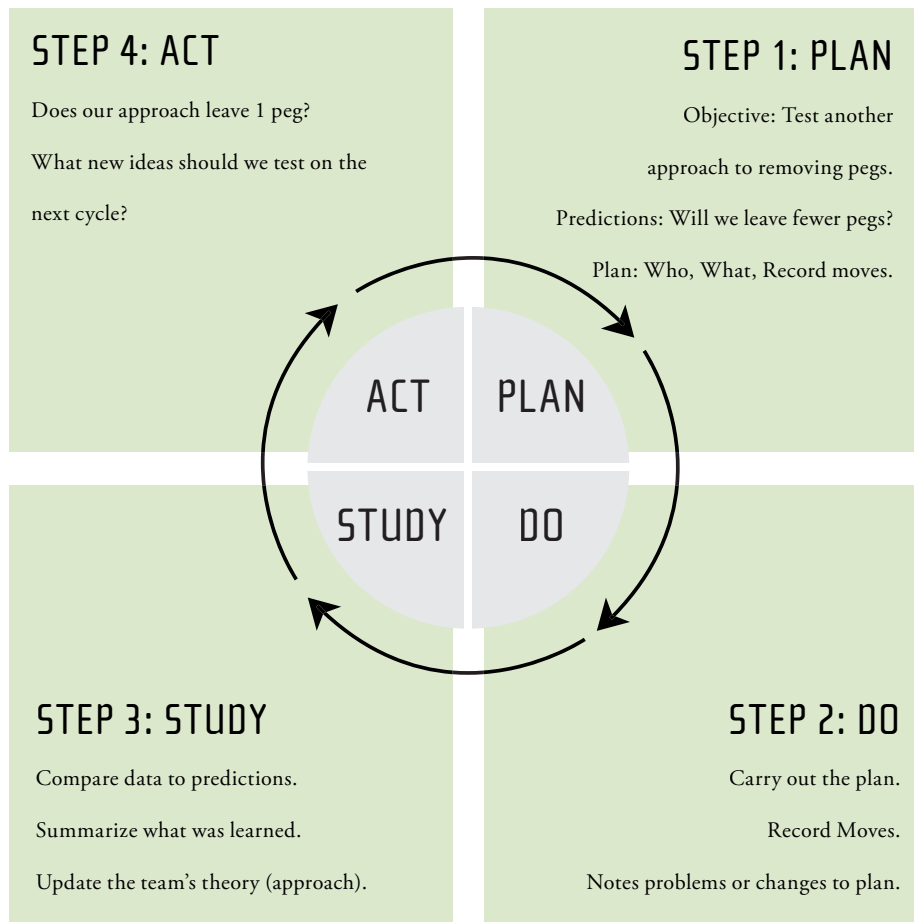
**Team Results Summary**

| TEAM | NUMBER OF CYCLES | BEST RESULT |
|------|------------------|-------------|
| 1    |                  |             |
| 2    |                  |             |
| 3    |                  |             |
| 4    |                  |             |
| 5    |                  |             |
| 6    |                  |             |
| 7    |                  |             |
| 8    |                  |             |
| 9    |                  |             |

Peg Game

## Attachment 4

## PDSA for the Peg Game





Attachment 5

To Be Considered a PDSA Cycle

- TO BE CONSIDERED A PDSA CYCLE:
  - The test or observation was planned (including a plan for collecting data).
  - The plan was attempted.
  - Time was set aside to analyze the data and study the results.
  - Action was rationally based on what was learned.

Peg Game

## Attachment 6

**Peg Game Answer Key**

1. Leave # 6 blank.
2. Complete the sequence of jumps in this order:

1 » 6

10 » 3

13 » 6

3 » 10

2 » 9

15 » 6

11 » 13

14 » 12

6 » 13

12 » 5

7 » 2

2 » 9

13 » 6